J. Helminthol. Soc. Wash.
64(1), 1997 pp. 154–156

Research Note

Absence of Hematozoa from Ferruginous Pygmy-Owls (*Glaucidium brasilianum*) in Southern Texas

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ABSTRACT: Blood smears were examined from 63 (14 females, 45 males, 4 nestlings) ferruginous pygmy-owls (*Glaucidium brasilianum*) captured during 1994–1996 in southern Texas. Of these, no hematozoa were observed. Absence of hematozoans may be a result of low vector abundance, low and chronic infections below levels of detection, an overdispersion of hematozoa masking the actual prevalence rates, or an innate ability of pygmy-owls to avoid blood-parasite infections.

KEY WORDS: Hematozoa, ferruginous pygmy-owl, *Glaucidium brasilianum*, Texas.

No hematozoa data are available for ferruginous pygmy-owls (*Glaucidium brasilianum*, Gmelin) in North America. Therefore, in conjunction with natural history studies (Proudfoot, 1996) on the threatened ferruginous pygmy-owl in southern Texas, blood from 63 owls (14 females, 45 males, 4 nestlings) was collected to determine the prevalence of hematozoa. This represents about 10% of the population (Proudfoot, unpubl. data).

Hematozoa are probably pathogenic in their natural host, although little is known about the physiological, behavioral, and ecological costs (Ewald, 1983; Atkinson and Van Riper, 1991). Hematozoa in owls may cause marginal anemia, neonatal bacterial diarrhea, and septicemia (Hunter et al., 1987). Although subclinical, the attritional effect of blood parasites may reduce survivability and recruitment or have no effect on the host (Davidar and Morton 1993). Understanding the factors affecting population dynamics of endangered or threatened species is critical for the conservation of these species.

The exoerythrocytic stage of *Haemoproteus* sp. target capillary endothelial cells, fibroblasts, and muscle tissue, while the gametocytes are within the peripheral blood (Couch, 1952). Because gametocytes are the infective stage for vectors, transmission is the culmination of a number of factors including survival, reproduction, and development within the vector, vector behavior, and the vector–bird association (Allan and Mahrt, 1989). Vectors for *Haemoproteus* spp. and *Leucocytozoon* spp. include the hippoboscid flies and ceratopogonid flies (*Culicoides* spp.) (Atkinson, 1991). Although we did not determine abundance of ornithophilic flies, hippoboscids were collected from adult pygmy-owls and nestlings and have been reported within the ecoregion of this study (Stabler, 1960).

Bennett et al. (1982) reported *G. brasilianum* as a host to *Haemoproteus* sp., *H. glaucidiumi* (Jorg, 1931), *Leucocytozoon* sp., and *L. lutzi* (Carini, 1920) in its southern range. A comprehensive study of avian hematozoa in Sao Paulo State, Brazil (Woodworth-Lynas et al., 1989) reported 8% of 121 species (32 families) infected. The only *G. brasilianum* observed was negative. Prevalence of hematozoa in 9 species of autumnal migrant raptors was reported at 75% (88/118) in the central U.S. flyway (Taft et al., 1996). The most common hematozoa were *L. toddi* (Sambon, 1908) and *Haemoproteus* sp. Incidence of hematozoa in 17 avian species in Texas was reported at 2.3% (Couch, 1952). The majority of these were *Haemoproteus* sp. infecting English sparrows, *Passer domesticus* (12/123), mourning doves, *Zenaida macroura* (201/213), and American kestrels, *Falco sparverius* (7/8).

Research was conducted within a 29,000-ha live oak (*Quercus virginiana*)–honey mesquite (*Prosopis glandulosa*) forest on the Norias Division of the King Ranch, Kenedy County, Texas (26°37′30″–26°51′30″N, 97°27′30″–97°43′30″W). The climate is subtropical with 68 cm mean annual precipitation and 24°C mean annual temperature (National Oceanic and Atmospheric Administration, 1995). Owls were collected from 10 March 1994 to 22 March 1996. Mean annual precipitation was 42.7, 92.6, and 10.16 cm in 1994, 1995, and January to June 1996, respectively.

Nylon mist nets and baited bow nets were used to capture adult ferruginous pygmy-owls from 10 March 1994 to 22 March 1996. Forty-one (65%) owls were captured during the spring months (January to June). Samples were collected 1 hr before sunset to 1 hr after sunset. Body mass was determined using a 300 g ± 3% pesola scale (Pesola Precision Scales, Switzerland). Wing chord, tail length, and total body length using a flexible ruler and measured for tarsus length with a dial caliper (505-101 Milutoyo). Owls were fitted with U.S. Fish and Wildlife Service aluminum leg bands and released after blood collection. Similar measurements were taken from 4 nestlings (4–7 days before fledgling) from 1 active nest box on 14 June 1995 between 0800 and 1000 hours.

To avoid injury and reduce stress, pygmy-owls were secured in 13- × -3.8-cm tubes and blood sample protocol followed Bennett (1970). Kwik-stop® (Gimborn-Rich Health, Atlanta, Georgia) or silver nitrate was applied to stop the bleeding. Thin blood smears were separated into 2 sets of 126 slides. One set of slides was viewed at Caesar Kleberg Wildlife Research Institute, and the other was sent to Dr. Gordon Bennett of the International Reference Center for Avian Haematozoa for verification. Slides were stained and examined as described by Bennett (1970).

Neither laboratory observed hematozoa. These results suggest this ferruginous pygmy-owl population is not affected by blood parasites. Possible causes for negative findings involve the host–parasite interaction: (1) the inability of pygmy-owls to maintain an infection, (2) infection rates are too low for observing blood parasites, (3) infection is highly virulent and lethal, and (4) overdispersion is occurring and the number of birds observed was insufficient to detect hematozoans. However, parasitemia has been reported in the southern range. This study was conducted continuously over 2 yr and all season, including wet periods. No nestling mortality nor abrupt perturbations in population occurred and an estimated 8–9% of the population was sampled, including 4 nestlings (Proudfoot, unpubl. data).

Other causes for the negative findings may involve vector–host interactions: (1) low vector abundance and prevalence or (2) pygmy-owls have an innate ability to avoid blood-parasite infections. However, hippoboscids were observed on adult pygmy-owls and collected from nestlings. And the ferruginous pygmy-owl is ecologically and behaviorally similar to other small strigiformes.

Ecological and physiological data remains limited on the ferruginous pygmy-owl. This information may aid ferruginous pygmy-owl management by directing resources toward demographic studies and other areas of research including vector ecology and immunological studies of the ferruginous pygmy owl.

We dedicate this manuscript to the memory of Gordon F. Bennett. We thank F. Chavez-Ramirez, R. T. Kazmaier, F. S. Guthery, S. A. Smith, and 2 anonymous reviewers for commenting on this manuscript. We thank M. Garvin, R. Rosenfield, and G. Jacobs for their assistance in conducting literature searches. Funding was provided by King Ranch Inc., Exxon Corp., Texas Wildlife Association, and the National Fish and Wildlife Foundation. This manuscript is Welder Wildlife Foundation No. 479.

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